Jane's®

COMBAT SIMULATIONS

FLASH POINT KOREA™

1996

First Edition

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First Edition

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WHAT'S IN THIS BOOK?

Several changes and additions have been made to the cockpit. The most significant change is the addition of a new, front-seat cockpit. Improvements have also been made to various MFDs, and a new laser targeting system has been implemented.

This book is divided into the following sections. (Page numbers indicate where this information would have appeared in the original *Longbow* manual.) For ease of reference, some section headings are named to correspond with the appropriate sections in the original manual.

FLASH POINT KOREA ADDITIONS (NEW)

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Starting the Game

To start playing the new campaign, install *Flash Point Korea* (refer to the *Install Guide* for details). Then, create a new pilot (or select an existing pilot not currently involved in the Baltic Hammer campaign) and visit the Campaign Building. You'll have two options — MORNING FURY (starts the new campaign) or BALTIC HAMMER (starts the original campaign).

AH-64D
LONGBOW

1 FLASH POINT KOREA ADDITIONS

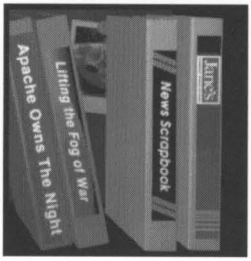
ON THE BASE CHANGES

Bunkhouse

You must create a new pilot when you start the Korean campaign, or use an existing pilot that is not currently involved in the Baltic Hammer campaign (in other words, has only flown historical/instant/random missions, or has finished the Baltic Campaign).

Previously, your pilot's callsign was not mentioned during any in-flight speech. Now, some radio messages reflect whichever callsign you selected when you created that pilot.

Training Building



All tutorial missions are still available. The only change to this building is that when you select the VIEW FILMS option, a new tape called *Jane's* appears on the VCR shelf. Select it to view background information on Jane's Information Group.

Instant Mission Tower

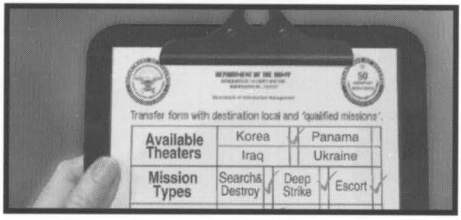
The Instant Action option can now create missions with the Korean map (if it is the most recently loaded map).

Single Mission Building

Escort, Deep Strike, and Search and Destroy missions based on the Korean map have been added to *Flash Point Korea*.

Additionally, the Single Mission clipboard no longer has JUNGLE, DESERT and FOREST options. These have been replaced as follows:

Old Name	New Name
DESERT	IRAQ
JUNGLE	PANAMA
FOREST	UKRAINE
(new)	KOREA



Campaign Mission Building

You must create a new pilot to start the Korean campaign, or use an existing pilot that is not currently involved in the Baltic Hammer campaign.

When you click on this building, a plaque is displayed with both BALTIC HAMMER and MORNING FURY options. Select MORNING FURY to start the new Korean campaign. (See p. 2.2 for background information on the new campaign.)

Mission Briefing Room

All mission maps in the game have three new features:

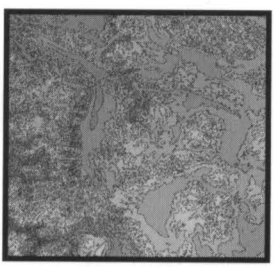
Light blue squares These boxes indicate Primary Engagement Areas and are labelled PRI (short for Primary) or EA (Engagement Area). You cannot toggle these squares on and off.

During a mission, most of your primary targets will be located somewhere inside this square. (Only one PRI appears per mission.)

Grid lines These superimposed lines provide alpha-numeric coordinates on all maps. You can toggle this option on/off with the NAVMAP GRID option in the **ON-BASE OPTION** menu (See p. 1.27), or press Alt G while in the nav map view.

Contour maps You can now view contour maps, as well as normal colour maps. This works only for Korean maps. Press Alt C to cycle through the map displays.

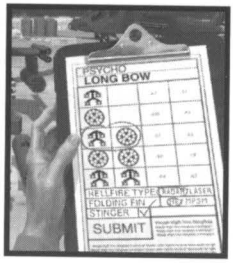
The lighter the colour of the contour, the higher the terrain. Low, flat areas appear as a darker shade of gray.



- The chalkboard in the Debriefing Area now has a "Friendly Fire" category that keeps track of how many friendly aircraft or ground vehicles/structures were damaged during the mission.

Arm Chopper

The clipboard in the Aircraft Arming Screen now has two FFAR rocket types. Click on the type you want to load:



HE High-explosive (normal) FFARs.

MPSM Multiple-projectile submunition FFARs, which separate prior to impact and release small projectiles. These work well against soft targets, such as soldiers and trucks.

- A few of the add-on missions contain a single enemy that renders the Longbow's Fire-Control Radar useless (but you won't know which object). You'll have a better chance of succeeding in these missions if you carry laser Hellfire missiles. Keep an eye on your mission briefing – it usually gives you a good idea of what to expect during a mission.
- FARP supplies vary from location to location.

Film Room

- Once you've installed *Flash Point Korea*,you can no longer access Flight Recorder missions you recorded in the original *Longbow* game. All new missions you record, however, will be available.

FLIGHT CONTROL CHANGES

Engage/Disengage Rotor

You can manually engage and disengage the rotor, as well as apply a rotor brake.

Ctrl R Engage/disengage rotor (toggle)

Use this when you want the rotor to keep spinning when disengaged (for example, when you're performing an autorotational landing and need to maintain rotor RPM).

R Apply rotor brake

Use this if you want to *stop* the rotor from spinning (when you're visiting a FARP or landing).

Ctrl S Replay last mission-specific radio message

This plays back the last radio message that relayed mission-specific information.

Autopilot

- When autopilot is active, text appears above the actual airspeed and altitude indicators on the IHADSS. It gives the current autopilot settings for airspeed and altitude. These settings change if you alter the autopilot settings.

  Ctrl ↑, ↓ Increase/decrease autopilot altitude

  Ctrl →, ← Increase/decrease autopilot forward airspeed

- Two autopilot settings are now available. Pressing A multiple times cycles through the settings.

  A (1x) Autopilot on a straight course (AP1 appears in the upper right corner of the IHADSS)

This takes you on a straight course, that follows your current heading at the current altitude and speed settings.

  A (2x) Fly toward next waypoint (AP2 appears in the upper right corner of the IHADSS)

The second time you press this key, the autopilot feature causes you to fly toward your next programmed waypoint.

  A (3x) Deactivate autopilot

Pressing this key a third time deactivates autopilot and gives you control of the helicopter.

- You can now go into a hover while autopilot is active. Pressing the normal hover key (H) during autopilot will slow you down and bring you into a stable hover.

  H Engage hover (HOV appears in the upper right corner of the IHADSS)

IHADSS CHANGES

The Integrated Helmet and Display Sight System has been updated in *Flash Point Korea*, especially with reference to sight and weapon status.

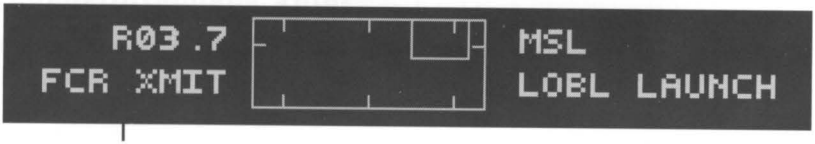
- IHADSS information is now superimposed onto the F2 (left cockpit) and F3 (right cockpit) views.
- When you toggle automatic camera views on (such as the "death view" camera), the name of the camera and its new status briefly displays on the IHADSS (for example, DEATHCAM ON).
- The Accelerometer (green, vertical bar on the left side of the High-Action Display) has been removed.
- Autopilot settings now appear above the digital altitude and airspeed readouts. (See p. 1.5 for new autopilot commands.)

High-Action Display

IHADSS. elements are now visible in the High-Action Display in Head-Down view (See **Optical Relay Tube (ORT) Unit,** p. 1.17) — digital airspeed appears in the upper left corner, altitude in the upper right.

Sight Status. The *sight status* field now indicates whether the laser or FCR is transmitting. The text to the bottom left of the High-Action Display changes, depending on what targeting system is active. If TADS is the active target acquisition system and the laser is turned on, LASE TARGET appears. Each time the laser transmits, a small asterisk flashes next to this text.

If the FCR target acquisition system is active, FCR XMIT appears.



Sight Status Field

Range. The *range* field now switches between three formats:

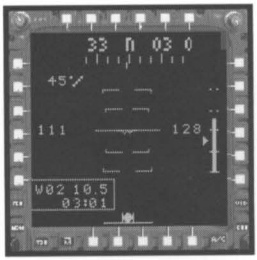
A##.#	TADS triangulation method of calculating range (highly inaccurate)
R##.#	FCR range (more accurate, but only updates once per scan). See **Realistic FCR Operation Commands**, p. 1.10.
*####	Laser range (most accurate). See **Laser Operations**, p. 1.18.
XXX.X	No range information is currently available.

The range reading changes as the currently most accurate method takes precedence.

MFD CHANGES

Flight MFD

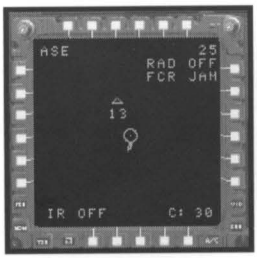
This new MFD page displays some IHADSS information — the pitch ladder, slip ball, current waypoint and distance to it, altitude, airspeed, heading and torque. (Refer to p. 2.19 in the original *Longbow Reference Manual* to learn how to interpret this display.)



FLIGHT MFD

Aircraft Survival Equipment MFD

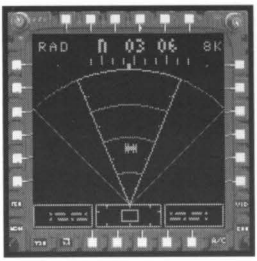
The ASE MFD now indicates when your Fire-Control Radar is being jammed by enemy systems. FCR JAM appears in the upper right corner of the MFD.



ASE MFD

Radar MFD

The Radar MFD page looks identical in *Longbow* and *Flash Point Korea* if you're playing the game normally. However, you have more control over the radar if REALISTIC FCR OPERATION is active in the **IN-FLIGHT OPTION** menu. See below for details.



RADAR MFD

Realistic FCR Options

Changes have been made to the Radar MFD, but they only display if you select new FCR options in the **IN-FLIGHT OPTION** menu under *Gameplay Realism/Custom*. They control how the FCR operates and change the appearance of the Radar MFD (as well as the TSD MFD).

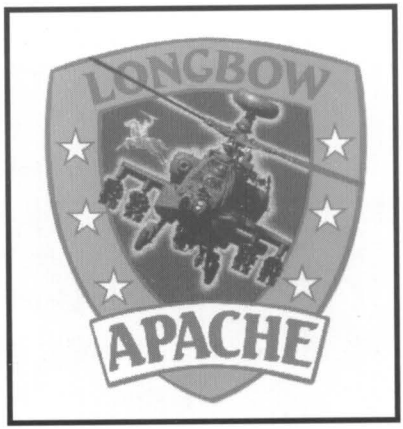
Numpad [Enter]	Turn radar on/off. This same key also turns the laser on and off in TADS mode.)
REALISTIC FCR SYMBOLS	This option replaces normal symbology on the Radar and TSD MFDs with new symbols (see facing page). They indicate whether targets are visible/not visible and moving/stationary.
REALISTIC FCR RANGE	The second option switches the available FCR ranges from 2.5/5/10/25/50km to .5/1/2/4/8km. With this option active, you press [Z] and [X] (or Numpad [+] and [-]) to cycle forward and backward through the ranges (instead of [Pg Dn]).
REALISTIC FCR OPERATION	The third option gives you manual control of the FCR scan by letting you change the size and direction of the radar scan. Since your radar can reveal your presence to some enemies, adjusting your FCR scan can help you avoid detection.

Realistic FCR Symbols

New symbols display on the Radar and TSD MFDs if REALISTIC FCR SYMBOLS is active.

Tracked Vehicle	No LOS*	
	LOS, stationary	
	LOS, moving	
Wheeled Vehicle	No LOS*	
	LOS, stationary	
	LOS, moving	
Air Defence Unit	No LOS*	
	LOS, stationary	
	LOS, moving	
Unknown Target	No LOS*	
	LOS, stationary	
	LOS, moving	
Helicopter	No LOS*	
	LOS, stationary	
	LOS, moving	
Aircraft	LOS, moving	

** Line of Sight*



Realistic FCR Operation Commands

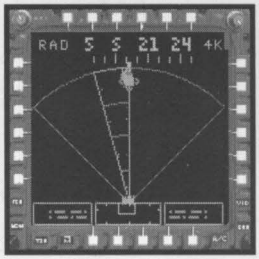
If FCR is the active target acquisition system, and REALISTIC FCR OPERATION is selected, you can control your Fire-Control Radar scan as follows.

Numpad [4], [6] Control direction of Fire-Control Radar scan (left or right)

Numpad [8], [2] Increase, decrease arc size of FCR scan (up to 90 degrees)

Reducing the arc of the scan reduces your visibility on enemy radar detection systems and gives you quicker updates.

When the radar is in air-to-air mode, the scan (at maximum width) appears circular on the Radar and TSD MFDs. In ground mode, the scan is pie-shaped.



RADAR MFD

[Z], [X] or Numpad [+], [-] Increase, decrease radar range (to .5, 1, 2, 4 or 8km) These ranges apply only if REALISTIC FCR RANGE is active. If not, the range is 2, 5, 10, 25 or 50km, and you must use the normal key ([Pg Dn]) to cycle through ranges.

Numpad [3] Toggles single or continuous FCR scan

Single means the radar only makes one sweep each time you turn it on. Continuous means that the radar keeps scanning the entire arc back and forth until you turn the radar off.

Numpad [9] Zoom Radar MFD image in around your current target. (ZOOM flashes in the lower left corner of the MFD.)

Downloading Targets to the Radar MFD

You can now download targets from other sources onto your Radar MFD if you've activated the realistic FCR options. Nearby ABCCCs (Airborne Battlefield Command and Control Centres) receive targets from other friendly ground and air units in the area. These targets are added to the ABCCC's list, giving you access to a comprehensive picture of the battlefield.

When you activate ABCCC targeting, targets from the nearest C&C centre are downloaded to your target list.

Ctrl ~ Download unseen targets to the Longbow target list

Note: *If you give your wingman the* Ctrl 4 Pop-up and Scan Area *command, he'll feed targets directly into your target list. You don't need to use* Ctrl ~ *to get his targets.*

Tactical Situation Display MFD

The TSD is identical between *Flash Point Korea* and *Longbow*, as long as you haven't activated the REALISTIC FCR OPERATION option in the **IN-FLIGHT OPTION** menu.

TSD with Realistic FCR

With the REALISTIC FCR OPERATION option active, the display changes slightly. The 90-degree arc that appeared in the original TSD MFD disappears. It is replaced by a pie-shaped arc (in ground mode) or circle (in air mode) that outlines the new scan area. You control the angle and size of this scan using Numpad keys.

See **Realistic FCR Operation Commands**, p. 1.10, for details.

Target Acquisition and Designation Sight MFD

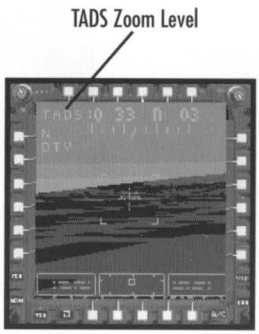
You now have more control over the TADS cameras, and you can display the TADS MFD as a full-screen view in the front seat. (See **Co-Pilot/Gunner (Front Seat) Cockpit, p. 1.16**, for details on the front seat.)

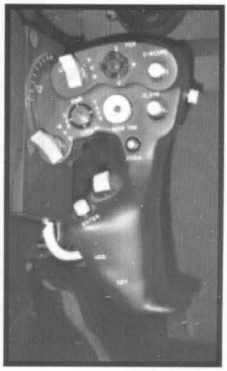
Numpad [.] — Toggle full-screen, Head-Down Display of TADS MFD (or Radar MFD, if FCR is active). Press again to return to normal cockpit view.

Numpad [1] — Cycle between TADS camera modes (FLIR, DVO and DTV)

Numpad [7] — Toggle between white-hot/black-hot FLIR imagery for the TADS camera
(see facing page)

[Z], [X] or [+], [-] — Switch TADS camera (FLIR, DTV and DVO) zoom level to Numpad [+], [-] Wide, Medium or Narrow
(medium only applies to FLIR)





TADS Camera Imagery

The TADS display has its three original camera types (FLIR, DVO and DTV), but with some improvements.

FLIR. This monochrome image has been improved, and you now have "white-hot" and "black-hot" options. White-hot displays white objects on a black background, while black-hot displays black objects against a white background.

DTV. The Daytime TV camera gives you a good visual of a target at the Narrow zoom level setting. Use this to identify targets at fairly long range.

DVO. The Direct-Video Optic camera is good for long-distance reconnaissance.

TADS and Realistic FCR

If REALISTIC FCR OPERATION is active, target symbology displays on top of the FLIR, DVO or DTV image when TADS is in full-screen view (CP/G cockpit only). This is useful because it shows exact target locations and helps to illuminate the targets against the terrain.

The symbology changes if you also have the REALISTIC FCR SYMBOLOGY option selected (see p. 1.9).

The currently locked target has cross hairs directly on top of it. When you switch targets, the cross hairs move as well. If a target is destroyed while you're in full-screen view, you'll see it explode.

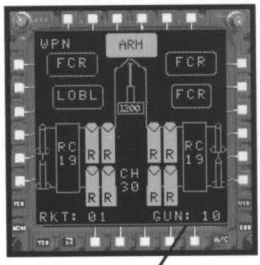
Realistic TADS Operation

If you've selected REALISTIC TADS OPERATION in the **IN-FLIGHT OPTION** menu (under *Gameplay/Realism*), you must manually activate the laser. See **Laser Operation**, p. 1.18, for details.

Weapons MFD

The Weapons MFD displays two additional pieces of information. It shows the burst rate of the gun and, if you loaded FFAR rockets, the rocket type (RC or MP).

Also, the location of the chaff pod reading (the number of pods remaining) has moved from the bottom of the display to the centre of the hardpoint display.



Gun Burst Rate

- If you loaded radar-guided Hellfires, the missile hardpoint box reads R. If you loaded laser-guided Hellfires, LR appears instead.
- You can now adjust the number of rounds that fire per trigger pull (referred to as a gun burst). Press G to cycle between 10, 20, 50 or 100 rounds. The currently selected gun burst rate displays in the lower right corner of the MFD.
- If you loaded HE FFAR rockets, the rocket hardpoint box reads RC. If you loaded multiple-projectile submunition rockets, MP appears instead.
- You must gain a lock before firing MPSM rockets. Select rockets as your active weapon, then wait for the I-beam cursor to turn solid.

System MFD

- The radar is no longer listed in this MFD. Instead, a message appears on the UPFRONT display if your FCR no longer functions.
- The UPFRONT display also shows critically damaged systems. See **Damage**, p. 1.24, for a list of messages.

WEAPON CHANGES

- Buildings now block your line of sight. You cannot acquire a lock if a building is blocking your view to the target.
- The rocket I-beam cursor on the IHADSS now has vertical constraints. It remains dashed until you bring the target into both horizontal and vertical constraints.
- The FLARE function is no longer an option in the remappable keyboard screen (IN-FLIGHT OPTION menu). Neither the Apache nor the Longbow Apache normally carry flares.
- The chain gun, missiles and rockets now have a noticeable recoil effect if you fire while in a hover — they cause the cockpit to jitter and can cause the helicopter to move.
- The Hellfire lock constraint remains on the IHADSS until the last Hellfire you launched detonates. This lets you know that you still have a valid line of sight to the target as the last missile is inbound. If the box turns dashed, you've lost your line of sight and your missile lock (in the case of laser Hellfires).
- You no longer have to unmask (pop up) in LOAL missile launch mode after launching your radar Hellfire. It re-acquires the target on its own.
- It is vital that you read your mission briefings very closely. They sometimes indicate what type of weapons you'll need to take on a specific mission.

AIR AND ARTILLERY STRIKES

Air and artillery strikes you call in now do more damage. More shells are dropped, and the strike lasts longer.

To make things even more interesting, enemy ground units can now call in their *own* air and artillery strikes. Whenever they're under attack, they radio for help in the form of enemy choppers that scramble, or air or artillery strikes from nearby units.

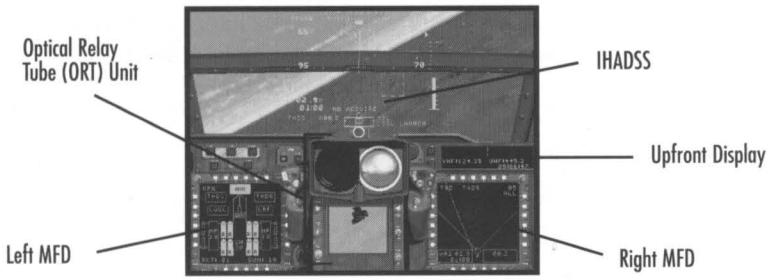
CO-PILOT/GUNNER (FRONT-SEAT) COCKPIT

Flash Point Korea features an additional cockpit for the co-pilot/gunner. You can perform most of the same tasks in the front seat as you can in the pilot's seat — the main difference is that the CP/G cockpit has a third cockpit element, the *Optical Relay Tube (ORT) Unit.*

The full-screen view of the ORT, known as the Head-Down Display (HDD), shows an image of the TADS or Radar MFD (whichever is active) with target information superimposed on top of it. This screen is repeated in a small, cockpit dash display known as the Head-Out Display (HOD). It shows a monochrome, image that duplicates what you see in the HDD.

Numpad [0] Toggle between front-seat (CP/G) and pilot's cockpit

Numpad [.] Toggle HDD mode (between full-screen or repeater mode)



IHADSS Normal IHADSS information appears in this cockpit.

MFDs The front-seat cockpit has two MFDs.

UPFRONT Text Display The top half displays damage information (and target information, if [U] is active), while the bottom half displays the elapsed mission time.

Optical Relay Tube Unit The ORT shows either the TADS or Radar MFD. You can view ORT information on a small screen in the cockpit (Head-Out Display), or in full-screen mode (Head-Down Display) by pressing Numpad [.] (toggle).

Uses for CP/G Cockpit

You don't *have* to use the second cockpit. The greatest advantage to using both, however, is that you can display different MFDs in each cockpit. Typically, offensive MFDs are most useful in the CP/G cockpit, and defensives ones in the pilot's cockpit.

Additionally, the cockpit dash view of the ORT is only visible in the front (CP/G) seat, and is sandwiched between the left and right MFDs.

IHADSS/MFDs/UPFRONT Display

The IHADSS display, MFDs and UPFRONT display operate just as they do in the back seat. You still switch the left and right MFDs normally (with [<,] and [>.]), and you can have different MFDs open in each cockpit.

Optical Relay Tube (ORT) Unit

In addition to two regular MFDs, the CP/G cockpit has an ORT unit that shows either the TADS (Apache and Longbow) or Radar MFD (Longbow only). The CP/G performs his targeting functions by either looking through the HDD (an eyepiece mounted in the middle of the cockpit dash) or at the HOD (small dash display).

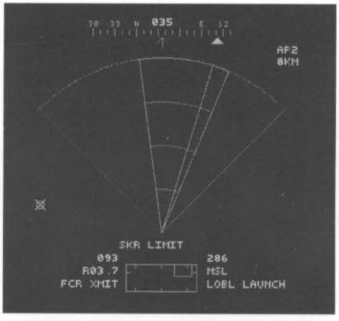
Head-Out Display (HOD)

The Head-Out Display emulates either the TADS or Radar MFD, depending on which acquisition mode is active. If TADS is the active target acquisition system, the TADS page appears. If you have FCR active, the Radar page appears.

See **Radar MFD** (p. 1.8) and **TADS MFD** (p. 1.12) for ORT view commands specific to these MFDs.

Head-Down Display (HDD)

You can "look" through the optical relay tube in the front-seat (CP/G) cockpit by using the Head-Down Display. When you do so, target information normally available in the TADS and Radar MFDs is superimposed over camera imagery in a full-screen view.



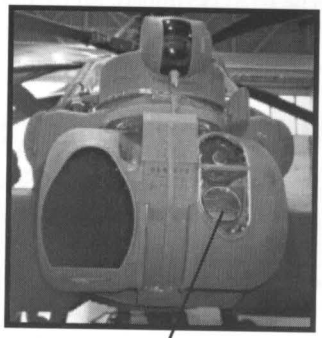
Your current airspeed appears in the upper left corner of the High-Action Display in this view. Current altitude appears in the upper right.

When you're *not* in HDD view, ORT information appears in the HOD dash display.

Numpad [.] Toggle ORT display between Head-Down/Head-Out view. The HDD view displays a full-screen TADS or Radar MFD (whichever system is active). Press again to return to HOD (dash) view.

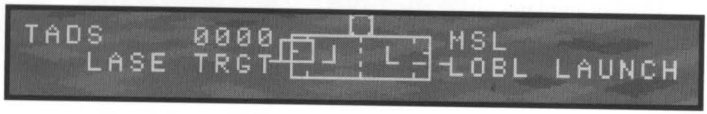
LASER OPERATION

Flash Point Korea models the Longbow's external laser sensor, which guides laser Hellfire missiles and provides accurate range-to-target information for your chain gun. The laser activates automatically in most cases, but you can take manual control of it if you select REALISTIC TADS OPERATION in the **IN-FLIGHT OPTION** menu (facing page).



Laser Transmitter

- Laser-targeting gives you better range feedback (and thus, accuracy) when you're firing guns, and gives you pinpoint accuracy when you're using laser-guided Hellfires.
- LASE TRGT appears to the bottom left of the High-Action Display when laser targeting is active. A small asterisk also displays just above this text (by the range-to-target reading) and means that the laser is transmitting.



- In some missions, you must lock onto a certain target with your laser and "hand off" that target to another friendly aircraft in the area. (Your mission briefing will indicate which missions.)

  A radio message will indicate when a friendly is looking for one of your laser targets. The target you designate with the laser automatically gets sent to that particular friendly unit. If you keep it illuminated, you'll get a second message stating that he has picked up the laser-designated target.

- The laser turns off automatically if your target moves out of TADS camera view.

In some missions, you can turn off your laser and fire Laser Hellfires at targets designated by other units. You must have realistic tads operation active. Simply cycle through targets until you get a valid target message in the Weapon Inhibit Field.

Realistic TADS and the Laser

Before you can manually toggle the laser on/off, you must select the REALISTIC TADS OPERATION option in the **IN-FLIGHT OPTION** menu (under the *Gameplay/REALISM* submenu). See p. 1.28 for details.

Numpad [Enter]	Toggle laser on/off (with TADS as active target acquisition mode)

You can activate the laser when you're using your chain gun. Although not required, it increases accuracy. You *must* have the laser active to fire Hellfire missiles, however. If you try to fire them while the laser is off, you'll get a NO ACQUIRE message above the High-Action Display.

- If REALISTIC TADS OPERATION is off, the laser activates automatically.
- If REALISTIC TADS OPERATION is active, but the laser is off, then your helicopter's weapon computer uses the best system available (usually the Fire-Control Radar). This can be inaccurate because targets may move before the FCR completes its next scan.
- If REALISTIC TADS OPERATION is active, but both the laser and FCR are off, then the weapons computer calculates the distance to the target based on the TADS camera angle and your current altitude. This is highly inaccurate, as it does not take things such as terrain into account.

Using the Laser with Laser Hellfire Missiles

🖱	Select Laser Hellfires in the *Aircraft Arming* screen.
[Alt][O]	Activate REALISTIC TADS OPERATION in the **IN-FLIGHT OPTION** menu.
[Home]	Toggle TADS target acquisition on. TADS appears to the left of the High-Action Display.
[Backspace]	Select Hellfire missiles.
[Shift][2]	Switch to Direct master mode (activates LOBL missile launch mode and TADS/TSD MFDs).
[L] or [T]	Lock onto a target and wait for missile lock tone.
Numpad [Enter]	Toggle laser on. (This also gives you accurate range-to-target information for your chain gun.)
[Spacebar]	Fire Hellfire.

WINGMAN CHANGES

- If you loaded Radar Hellfires onto your wingman's hardpoints, he now has the ability to ripple-fire Hellfires and perform LOAL Hellfire attacks. This is useful when you establish Priority Fire Zones for your wingman.
- You can now give wingmen additional commands:

Ctrl 4	Pop Up and Scan Area	This command was previously called *Give Me Your Targets*. Your wingman will pop up to about 200 feet, acquire targets, and return to formation. The targets he identifies automatically show up in your TSD. You can be in either TADS or FCR mode for this to happen.
Ctrl 8	Check Status	Use this command to check your wingman's current status. He'll radio back a message that indicates his weapons loadout status.
Ctrl 9	Stay Here	Wingman stays in current geographical position and hovers. You can use this command after downloading your PFZ targets (Alt Backspace) to your wingman. He'll stay in one spot while you move to another position. Both of you can then attack targets from two directions. Make sure, however, that you return to your original position before ordering him into formation (Ctrl 7). Otherwise, he may fly directly over enemy units.
Ctrl 0	Change Formation	You can give your wingman formation commands that instruct him to fly 50m (default) or 150m away from you. Ctrl 0 toggles the formation distance.

Ctrl -	Attack ATA/ATG targets	You can specify what type of targets you want your wingman to attack when he's in *Weapons Free* mode. This command toggles between ATA (air-to-air) and ATG (air-to-ground) targets.
Ctrl +=	Cover Me	This command places your wingman in protective mode. He'll hold his fire unless something directly threatens you, at which point he'll attack. Any other wingman command cancels this one.
Ctrl Bksp	Hand Off Targets	You can give your wingman this command to give him a target, but he won't attack it. He'll automatically go into *Weapons Hold* mode and won't fire until you give him the *Weapons Free* command. When you do, he'll attack that specific target first. If you're using a PFZ, you can give him up to 16 targets (the maximum number of FCR targets he can store).
Ctrl H	Go Home	This command was previously Ctrl 8, but still functions identically.

MISCELLANEOUS CHANGES

Flight Dynamics

- You gain altitude less quickly when you drop collective and pitch up to lose speed and transition into a hover.
- You can now turn individual engines on and off using the keyboard. If one of your engines catches fire, it's a good idea to shut it down.

  Ctrl [Turn left engine on/off (toggle)

  Ctrl] Turn right engine on/off (toggle)

- You can now stop the rotor, versus disengaging it (which is what R did in *Longbow*). The difference is that if you want to autorotate, you can disengage the rotor and it will still spin. The rotor brake, however, stops all circular rotor motion.

  R Turn rotor brake on/off (toggle). You need to use this key before take offs (except in Random and Instant Missions) and landings. You should also use it when visiting FARPS (so no one on the ground gets injured).

  Ctrl R Engage/disengage the rotor (toggle). This happens automatically if both engines lose power (so that you can autorotate).

- Rotor speed does not bleed off as quickly when you go into autorotation.
- Maximising collective now causes a reduction in rotor speed. This occurs because as the collective is increased, the extreme pitch angle of the blade causes the engine to bog down.

Artificial Intelligence

- Most game objects now have simple mission objectives, which instruct them to move toward certain waypoints, provide combat air support, etc.
- Mobile objects won't always be at the same location when you replay a mission — just because you saw a tank over a hill to the south doesn't mean it will show up there again if you re-fly that mission.
- Enemy vehicles now have "Panic AI" that lets them evade or radio in for air/artillery support.
- Tanks will shoot both their coaxial machine gun and their main cannon at you.
- Tank armour is thinner in certain areas (rear and top).
- Depending on how the battle progresses, your objectives may change in mid-mission. This will be reflected in an in-flight radio message you receive during the mission. An example: a friendly tank platoon comes under attack, and you're called in to provide air support. The new objective overrides the old one.
- Some targets remain destroyed in successive missions in an area if you've destroyed it previously. (This mostly pertains to static structures, such as bridges.)

Damage

- More systems can now be damaged on your helicopter. However, you also have more damage control options (such as a fire extinguisher). If one or both engines catch fire, you can manually extinguish the blaze from the cockpit. (The extinguisher works on either engine, but you can only activate it once per mission.)

  Ctrl F Activate fire extinguisher (fire bottle)

- If one of your engines has been severely damaged, you can shut it down using Ctrl [(shut down left engine) and Ctrl] (shut down right engine).

- The UPFRONT display shows additional damage information that doesn't display in the System MFD.

IHADSS FAIL	**Integrated Helmet and Display Sight System Failure.** IHADSS is damaged/destroyed and no longer displays.
FCR FAIL	**Fire Control Radar Failure.** Fire-Control Radar is damaged/destroyed and can no longer detect new targets or guide Radar Hellfires.
LASER FAIL	**Laser Spot Tracker/Designator Failure.** Laser optics are damaged/destroyed and are no longer able to lase targets or guide laser Hellfires.
TADS FAIL	**Target Acquisition and Designation System Failure.** TADS optics are damaged/destroyed, and TADS camera no longer pans.
PNVS FAIL	**Pilots Night Vision System Failure.** Night vision optics are damaged/destroyed, and you can no longer use PNVS.
FLIR FAIL	**Forward Looking Infrared System Failure.** FLIR optics are damaged/destroyed, and you no longer receive FLIR images.
RJAM FAIL	**Radar Jammer Failure.** Radar jammer is damaged/destroyed and can no longer jam radar guided missiles.
RWR FAIL	**Radar Warning Receiver Failure.** RWR is damaged/destroyed, and the ASE MFD no longer appears. Chaff and jammer systems do not automatically engage threats. "APR-39 Failure" message sounds.
SCAS FAIL	**Stability Control Augmentation System Failure.** Digital flight control system is damaged/destroyed. You cannot auto-hover, and the helicopter's flight characteristics suffer.

APU FAIL

Auxiliary Power Unit Failure. APU is damaged/destroyed, and you cannot restart the engines if they are shut down. "APU is on fire" message sounds.

BUCS FAIL

Back-Up Control System Failure. Back-Up Control System is damaged/destroyed. "BUCS has failed" message sounds.

The hydraulic system must remain functional for the BUCS to operate. If both the SCAS and BUCS are damaged, then the aircraft is no longer controllable.

OIL PSI LO

Oil Pressure Low. Oil line is leaking/destroyed. Engine temperature increases and the chance of fire increases.

FUEL PSI LO

Fuel Pressure Low. Fuel line is leaking/destroyed. Fuel consumption increases, and if your helicopter is on fire, it will probably spread.

HYD PSI LO

Hydraulic Pressure Low. Hydraulic lines are damaged/destroyed. Hydraulic pressure drops, and control response deteriorates.

Audio/Sound/Speech

- You can now hear sound effects while in exterior camera views.
- Your callsign is now reflected in some in-flight radio messages.
- (16+ MB machines only) Each type of object in the game has a unique sound effect — all helicopters have their own rotor sound, as do all tanks, ground vehicles and weapons. You'll hear these sounds during flight if you have BACKGROUND NOISE active in the **IN-FLIGHT OPTION** menu.
- In-flight radio messages are more important than ever. The battlefield is more dynamic, and you'll need to cue into what's happening with your wingman and friendly ground units.

Hardware

- MS Sidewinder Pro is now a flight device option in the **IN-FLIGHT OPTION** menu. (Before, this device had to be set up as a Thrustmaster joystick.)

To select the CH Flight Stick Pro/Sidewinder Pro

1. Choose the CH FLIGHT STICK PRO OR SIDEWINDER PRO option.
2. Make sure that the slider control on the front of the Sidewinder is set to FLIGHT STICK PRO (one dot).

If you experience problems with this joystick during flight, try selecting THRUSTMASTER FCS instead of FLIGHT STICK PRO in Step 1, and change the MS Sidewinder emulation switch to Thrustmaster FCS mode (two dots).

General Joystick Notes

- In *Longbow*, all joysticks function better when you run the game through DOS instead of *Windows* 95.
- If you're having problems keeping your joystick calibrated, you may be using a joystick port that is too fast for the software's calibration routine. We recommend that you use a speed-adjustable game card to get the best performance from your joystick.

OPTION MENU CHANGES

On-Base Option Menu

The **ON-BASE OPTION** menu has changed as follows: (To activate the menu, press Alt O between missions.)

FLIGHT SCREEN RESOLUTION	Adjust screen resolution during flight to 320 x 240 or 640 x 480.
NAVMAP GRID	Toggle grid lines on/off in all mission planning maps. (Or, you can press Alt G while in the nav map view.)
PLAY DEBRIEF MOVIES	When active, plays success and failure movies after you land. When inactive, these movies do not play.

In-Flight Option Menu

Realism Options

As each mission loads, many of the current game settings display on-screen (such as flight model, realism setting, enemy quality, video mode, etc.)

Graphics

HOLLYWOOD EXPLOSIONS	Toggle graphically detailed explosions on/off (16+ MB machines).
RESTORE DEFAULT SETTINGS	Revert all graphical options to their original state.

Sound

REVERSE CHANNELS	Switch left and right speaker channels.
BACKGROUND NOISES	Toggle sound effects for other objects on/off (16+ MB machines).

Controls

CH FLIGHTSTICK PRO or SIDEWINDER PRO	Select Flightstick Pro System or MS Sidewinder Pro as the active flight device.

Gameplay

REALISM

CP/G PRIORITISES AIR TARGETS	When active, the CP/G automatically targets air threats when TADS is the active target acquisition mode.
REALISTIC FCR RANGE	When active, FCR range information affects size of radar scan in TSD MFD. (See p. 1.10 for details on how to change the size of the scan.)
REALISTIC FCR SYMBOLS	Replace FCR symbology and indicate whether targets are visible/not visible/moving/stationary. (See p. 1.9 for symbols).
REALISTIC FCR RANGE	Switch FCR range from 2.5/5/10/25/50km to .5/1/2/4/8km. With this option active, Z and X (or Numpad +, -) cycle through the ranges, not Pg Dn.
REALISTIC FCR OPERATION	Allow manual control of the size/area of the FCR scan. (See p. 1.10 for details.)
REALISTIC TADS OPERATION	When active, laser must be activated manually (normally, it activates automatically).

CP/G INVOLVEMENT

Now, instead of selecting SPOTTING AND COUNTERMEASURES or SPOTTING ONLY, you can select each option independently. If neither option is selected, the CP/G gives you radio messages that indicate the current target's range and bearing.

Left-click in a checkbox to activate that option.

NOTHING	Co-pilot/gunner does nothing (you target/ fire weapons). weapon tasks.
CM	Co-pilot/gunner only controls countermeasures (jamming, chaff).
SPOTTING	Co-pilot/gunner identifies and reports targets, and locks onto any air threats. (Press Alt A to toggle SPOTTING in flight.)
	If this option is off, targets are not automatically added to the TADS target list. You must manually use TADS to select and lock a target (press L). The target is then added to the target list, and can be targeted normally with T or Y.
L	Add target to TADS target list.

2 CAMPAIGN BACKGROUND

OVERVIEW: OPERATION MORNING FURY

Jane's Defence Weekly

10 January 1996 Volume 25, Issue 2; page 5

N Korea Steps Up Exercises

The USA is closely watching the winter exercises by the North Korean military because they are "at a higher level than they were last winter", according to Defence Secretary William Perry.

"If we look over the last 10 to 20 years, they are at the upper end of the scale of intensity of exercises historically," Perry told reporters at a press conference.

At this time, the USA is "not alarmed", Perry said, noting that the exercises "are at the high end of the scale, but not off it."

However, the massive food shortages and possible famine that has recently emerged in North Korea is causing additional concern. The food shortages are a "real aggravation factor on top of what is already a normally worrisome situation," Perry said. So far, no additional deployments of US forces or equipment is contemplated.

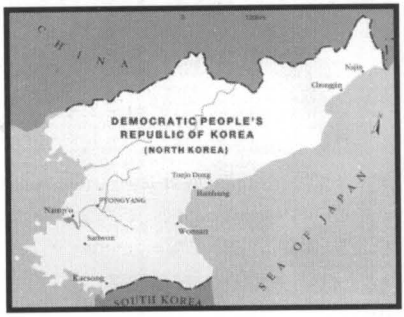
Jane's Defence Weekly

3 April 1996 Volume 25, Issue 14; page 3

North Korea Redeploys Aircraft Closer to DMZ

By Barbara Starr

North Korea has redeployed combat aircraft to locations near the Demilitarised Zone, according to General Gary Luck, Commander-in-Chief of the Republic of Korea/US Combined Forces Command and US Forces Korea.



The new locations are "only six minutes' flying time from the Republic of Korea's Blue House, the home of President Kim Young Sam, or for that matter, to Yongsan, my headquarters," Gen Luck told the House National Security Committee on 28 March. Gen Luck said that with over one million men positioned far forward, North Korea is now capable of "striking at the heart of Seoul without moving a single piece of their vast arsenal forward."

Jane's Defence Weekly

3 April 1996 Volume 25, Issue 14; page 19

Starvation Threatens Stability in North Korea

By Mike Bryant

Massive grain shortages, the consequent widespread starvation and the steps that will have to be taken to alleviate the crisis are the greatest threats to North Korea's stability, writes Mike Bryant.

There have already been reports from neighbouring China that North Korean troops are crossing the border to steal grain from Chinese peasants.

The Democratic People's Republic of Korea (DPRK) has a fast imploding economy. One of the most obvious manifestations is falling agricultural productivity. Industrial stagnation, inefficient technology, floods and the autarchy inherent in the economy all contribute to worsening output levels. Rationing is being introduced among the peasant population and health standards are still falling.

North Korea was forced for the first time last year to accept food aid from traditional enemies such as South Korea, to compensate for its estimated food shortfall. This month 7,300 tons of rice are being shipped to the DPRK under the UN World Food Programme.

In an attempt to maintain their own food supply, North Korean troops have raided grain stocks, possibly with official approval. This desperate measure will not increase the confidence and morale of the armed forces nor will it inspire agricultural workers to toil harder. Confidence in the economy and, ultimately, in the political leadership, will dissipate. If front-line military units go hungry, border incursions can only escalate.

Jane's Defence Weekly

17 April 1996 Volume 25, Issue 16; page 27

North Korea Troops Violate DMZ Agreement

North Korea has sent heavily armed ground troops into the Demilitarised Zone (DMZ) separating the two Koreas on at least three occasions, says the UN Command in South Korea. This follows an announcement on 4 April that it would no longer respect rules governing the 1953 Korean War armistice agreement.

Pyongyang formally repudiated the armistice two years ago and has since chipped away at the Military Armistice Commission that governs contacts between the signatories, including activities within the DMZ.

Its most recent action saw armed patrols of fewer than 200 troops enter the DMZ on three consecutive days and then withdraw after evening "exercises."

The armistice agreement prohibits the deployment into the DMZ of more than 35 troops or officials from each side, and limits their weapons to sidearms.

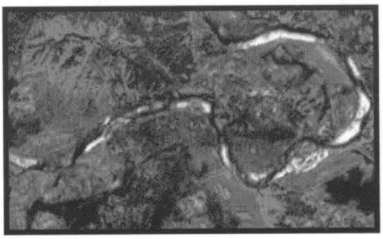
North Korea's aim is seen by observers as seeking to pressure the USA into direct talks and a bilateral peace treaty that would bypass South Korea. The USA also favours a peace treaty — but only if it includes Seoul.

Jane's Defence Weekly

12 June 1996 Volume 25, Issue 24; page 31

North Korea's Collapse Is Threat To Stability

By Barbara Starr



The weakened economy and political instability of the Democratic People's Republic of Korea (DPRK) has led the USA to conclude that the disintegration of North Korea is inevitable and is a key concern in potential destabilisation throughout the Asia/Pacific region. "We worry that in a very short period, this country will either collapse, or take aggressive actions against the South in a desperate attempt to divert attention from its internal situation," said Gen Gary Luck, who fills three jobs as Commander-in-Chief United Nations Command, Commander-in-Chief ROK/US Combined Forces Command and Commander US Forces Korea.

According to Defence Intelligence Agency (DIA) Director Lt Gen Patrick Hughes, the potential for war on the Korean peninsula today is the agency's "primary near-term concern". Although US intelligence community assessments calculate that the North Korean regime wants limited co-operation with the West to help ensure its own survival, the security situation north of the De-Militarised Zone (DMZ) remains highly complex. "We must now watch for signs of both 'explosion' and 'implosion'," said Hughes.

On the "explosion" side of the equation, the DIA is worried that North Korean "war preparations" could escalate uncontrollably. "Over the past year, continued movement of long-range artillery and missiles to forward units and the deployment of some aircraft to forward airfields are noteworthy, further limiting our ability to provide adequate warning of North Korean attack," Gen Hughes recently told the Senate Select Committee on Intelligence.

It is North Korea's economic crisis that the DIA fears will lead to an "implosion" of the country that could in turn result in a military action against the south. If war breaks out, the USA is prepared to take actions unique to the theatre.

Jane's Defence Weekly

3 July 1996 Volume 26, Issue 1; page 17

USA Strengthens Air Arm in South Korea as Apaches Move In

US Forces Korea (USFK) will add a brigade-level aviation headquarters to its 2nd US Infantry Division under a reorganisation that includes replacing AH-1 Huey Cobra close support and attack helicopters with the more advanced AH-64 Apache attack helicopter.

The changes do not significantly alter the authorised strength of US forces deployed in South Korea but add to their war-fighting capabilities, a USFK spokesman said. They are part of a "previously-announced long-scheduled modernisation programme", he added.

There are already two US Army Apache units assigned to South Korea, one of which will be transferred to the newly-formed 6th Cavalry Brigade. Previously designated as the 5th Battalion, 501st Aviation Regiment, it has been renamed as the 1st Sqn, 6th Cavalry, but will continue to be based at Camp Eagle. They will be joined by the 3rd Sqn, due to operate from Camp Humphreys.

The following two "articles" provide fictional background for the game's Korean campaign.

Flash Point Korea

28 July 1997 Volume 29, Issue 3; page 78

Korean Tensions Mount

The US and South Korea have found themselves in a chilling face-off with North Korea following an embargo of agricultural aid to the famine-ridden country. The ban surfaced after several recent skirmishes along the de-militarised zone established as part of the 1953 Korean Armistice.

Previously, South Korea, the US and other United Nations countries had been shipping 2,200 tons of famine-relief goods to North Korea per week. The airdrops were ordered discontinued last week as the weak link between political factions in the two Koreas further deteriorated.

North Korea, which refuses to cease its espionage operations despite the decades-old armistice agreement, has plead publicly for famine assistance. Wrought with hunger and a lack of harvestable crops, the country's level of civil unrest places an uneasy strain on the North Korean Communist government, which already lacks defined leadership.

Flash Point Korea

8 September 1997 Volume 30, Issue 5; page 42

US Pilot Killed; Infiltrator Warns of Invasion

Kyung Li Park, the last of a group of Communist infiltrators whose Sang-o class submarine malfunctioned off the coast of South Korea, was apprehended yesterday after an extended manhunt involving thousands of troops. Korean officials in charge of interrogation efforts claim that Parks has disclosed plans for an upcoming invasion against South Korean and American forces near the de-militarised zone (DMZ).

The admission comes a week after the US Army mobilised its 4th Infantry Division and transferred airborne units from Fort Hood, Texas, to Seoul and Chunchon. Seventeen operational Longbow Apaches are being shipped into the arena to augment Apache units already assigned to South Korea under the new 6th Cavalry Brigade.

This activation of forces has hindered talks concerning access to North Korea's nuclear sites, which until recently had been complying with international inspection team efforts. It has interrupted an already-fragile peace as well, evident by the number of light artillery skirmishes that have erupted along the border of the DMZ.

Hostilities between North Korea and the US are at a post-Cold War high as well, sparked by an unprovoked attack against an American Kiowa scout helicopter in which one pilot was killed.

2nd Lt. Will McBurnett reportedly went down at 2100 hours late yesterday after encountering a heavy barrage of sniper fire during a routine patrol exercise. According to the Pentagon's official report, the pilot's last confirmed radio message warned of a massive collection of North Korean forces near Chunchon. FLIR images downloaded by McBurnett several minutes before the incident revealed several hundred tanks, a forward airbase (possibly serving Mig-29 and SU-25 fighters) and roving AA convoys.

Intelligence sources suspect that the aggregate force is much larger, and US military analysts are prepared to act accordingly. The possibility of full-scale war has neither been denied nor confirmed, although it seems starkly imminent.

3 SPECIFICATIONS

Specifications

The following specifications are new and appear in some entries.

Crew. Maximum number of crew members the vehicle or mobile gun can carry.

Payload. Maximum weight of warhead a missile can carry (minus the weight of the propellant).

Width. For ground vehicles and guns, the width of the object at its widest point (measured in meters).

Smoke-laying equipment. For tanks, what type of smoke-creating element is carried.

Several new aircraft, tanks, other vehicles and weapons appear in *Flash Point Korea*. Only the most significant additions have individual entries in this section (soldiers do not).

Military Aircraft: Fixed/Rotary Wing

A-5C Fantan

MiL Mi-8 Hip

Anti-Aircraft/Artillery/SAMs

Boeing Avenger Pedestal-Mounted Stinger

MIM-146 ADATS

FROG-7

Dog Ear Surveillance Radar

Spoon Rest A Radar

Tin Shield Radar

122mm Howitzer M-1974

M-46 130mm Field Gun

ZPU-1/2/4 Anti-Aircraft Gun

Armoured Vehicles

T-54/T-55 Main Battle Tanks

T-62M Main Battle Tank

PT-76 Light Amphibious Tank

BMP-1 Infantry Fighting Vehicle

BMP-2 Infantry Fighting Vehicle

SO-122 Artillery

Soldiers

Soldier with shoulder-mounted anti-aircraft missiles

Soldier with shoulder-mounted bazooka

Soldier with machine gun

Buildings

Chemical weapon plant

Nuclear plant

Pagoda

Village building

MILITARY AIRCRAFT: FIXED/ROTARY WING

A-5C Fantan

SECTION
AIRCRAFT - FIXED WING - MILITARY

COUNTRY
CHINA, PEOPLE'S REPUBLIC

TITLE
NAMC Q-5; Qiangjiji-5 (Attack aircraft 5) or Qiang-5 (Chinese name); A-5 (Westernised designation); Fantan (NATO reporting name)

TYPE
Single-seat close air support and ground attack aircraft, with air-to-air combat capability

PROGRAMME
Derivative of J-6 fighter, originating August 1958; prototype programme cancelled 1961, but kept alive by small team and resumed officially 1963; first flight 4 June 1965; series production approved at end of 1969, deliveries beginning 1970.

VARIANTS
Q-5 Initial production version, with internal fuselage bay, two underfuselage attachments, and two stores pylons beneath each wing. Some adapted for nuclear weapon delivery tests in early 1970s.

Q-5 I Extended payload/range version, with internal bomb bay blanked off and space used to enlarge main fuselage fuel tank and add a flexible tank; underfuselage stores points increased to four.

Q-5 IA Improved Q-5 I, with additional underwing hardpoint each side, new gun/bomb sighting systems, pressure refuelling, and added warning/countermeasures systems. Later fitted with radar warning receiver (Q-5 II).

DESIGN FEATURES
Mid-mounted sweptback wings; air intake on each side of fuselage abreast of cockpit; twin jetpipes side by side at rear with upper and lower pen-nib fairings aft of nozzles; dorsal spine fairing; shallow ventral strake under each jetpipe; all-swept tail surfaces.

SYSTEMS

Dual air-conditioning systems, one for cockpit environment and one for avionics cooling. Two independent hydraulic systems, each operating at pressure of 207 bars (3000lb/sq in). Primary system actuates landing gear extension and retraction, flaps, airbrake and afterburner nozzles; auxiliary system supplies power for aileron and all-moving tailplane boosters.

AVIONICS

Include CT-3 VHF com transceiver, WL-7 radio compass, WG-4 low altitude radio altimeter, LTC-2 horizon gyro, YD-3 IFF, Type 930 radar warning receiver (antenna in fin-tip) and XS-6 marker beacon receiver. Combat camera in small 'teardrop' fairing on starboard side of nose (not on export models). 'Odd Rods' type IFF aerials under nose on Q-5 variants, replaced on A-5C by a single blade antenna. Space provision in nose and centre- fuselage for additional or updated avionics, including an attack radar.

ARMAMENT

Internal armament consists of one 23mm cannon (Norinco Type 23-2K), with 100 rds, in each wingroot. Ten attachment points normally for external stores two pairs in tandem under centre of fuselage, and three under each wing (one inboard and two outboard of mainwheel leg). Fuselage stations can each carry a 250kg bomb. Inboard wing stations can carry 6kg or 25lb practice bombs, or a pod containing rockets. Centre wing stations can carry a 500kg or 750lb bombs, or similar.

SPECIFICATIONS

DIMENSIONS (EXTERNAL)

	Q-5 IA	A-5C
Wing span	9.68m	9.70m
Length overall		
incl nose probe	15.65m	16.255m
excl nose probe		15.415m
Height overall	4.333m	4.516m
Max T-O weight		
clean	9486kg	9530kg
with max external stores	11830kg	12000kg
Max speed		
at 11000m	Mach 1.12 (643 knots; 1190km/h)	
at S/L	653 knots (1210km/h)	
Max rate of climb at 5000m	4980-6180m/min	
Combat radius with max external stores, afterburners off		
lo-lo-lo (500m)	216nm (400km)	
hi-lo-hi (8000/500/8000m)	324nm (600km)	
Range at 11000m	nearly 1080nm (2000km)	

MIL Mi-8 Hip

SECTION
AIRCRAFT - ROTARY WING - CIVIL, MILITARY

COUNTRY
RUSSIA

TITLE
MiL Mi-8 (V-8); Hip (NATO reporting name)

TYPE
Twin-turbine multi-purpose helicopter

VARIANTS
Mi-8 ('Hip-C') Civil passenger helicopter; standard seating for 28-32 persons in main cabin with large square windows. Detailed description applies to this version, except where indicated.

Mi-8 Salon ('Hip-C') Deluxe version of standard Mi-8; normally 11 passengers, on eight-place inward facing couch on port side, two chairs and swivelling seat on starboard side.

Military versions, with smaller circular cabin windows, are'Hip-C' Standard assault transport of CIS army support forces; twin-rack for stores each side, to carry 128 x 57mm rockets in four packs, or other weapons.

'Hip-D' Airborne communications role; as 'Hip-C' but rectangular section canisters on outer stores racks.

'Hip-E' Development of 'Hip-C'; flexibly mounted 12.7mm machine-gun in nose; triple stores rack each side, to carry total 192 rockets in six packs, plus four M17P Skorpion (AT-2 'Swatter') anti-tank missiles (semi-automatic command to line of sight) on rails above racks.

'Hip-F' Export 'Hip-E'; missiles changed to six 9M14 (NATO AT-3 'Saggers'; manual command to line of sight).

'Hip-J' ECM version; additional small boxes each side of fuselage.

'Hip-K' (Mi-8PP) ECM communications jammer; rectangular container and array of six cruciform dipole antennae each side of cabin.

DESIGN FEATURES
Conventional pod and boom configuration; five-blade main rotor, inclined forward 4° 30' from vertical; interchangeable blades of basic NACA 230 section, solidity 0.0777; spar failure warning system; drag and flapping hinges a few inches apart; blades carried on machined spider; pendulum vibration damper; three-blade starboard tail rotor.

SYSTEMS

Standard heating system can be replaced by full air-conditioning system. Two independent hydraulic systems, each with own pump; operating pressure 44-64 bars (640-925lb/sq in). DC electrical supply from two 27V 18 kW starter/generators and six 28Ah storage batteries; AC supply for automatically controlled electrothermal de-icing system and some radio equipment supplied by 208/115/36/7.5V 400Hz generator, with 36V three-phase standby system.

AVIONICS

R-842 HF transceiver, frequency range 2 to 8 MHz and range up to 540nm (1000km); R-860 VHF transceiver on 118 to 135.9 MHz effective up to 54nm (100km; 62 miles), intercom, radio telephone, ARK-9 automatic radio compass, RV-3 radio altimeter with 'dangerous height' warning, and four-axis autopilot to give yaw, roll and pitch stabilisation under any flight conditions, stabilisation of altitude in level flight or hover, and stabilisation of preset flying speed; Doppler radar box under tailboom.

ARMAMENT (See VARIANTS)

SPECIFICATIONS

DIMENSIONS (EXTERNAL)	
Rotor diameter (main)	21.29m
Rotor diameter (tail)	3.91m
Length	
overall, rotors turning	25.24m
fuselage, excl tail rotor	18.17m
Height overall	5.65m
T-O weight	
with 28 passengers, each with 15kg of baggage	11570kg
with 2500kg of slung cargo	11428kg
Max T-O weight (vertical)	12000kg
Max level speed at 1000m	
normal AUW	140 knots (260km/h)
Service ceiling	
normal AUW	4500m
max AUW	4000m
Ranges	
cargo version at 1000m, with standard fuel	5% reserves 242nm (450km)
with 24 passengers at 1000m, with 20 min fuel reserves	270nm (500km)
cargo version, with auxiliary fuel, 5% reserves	518nm (960km)

ARMOURED VEHICLES

T-54/T-55 Main Battle Tanks

SECTION
MBTs AND MEDIUM TANKS

COUNTRY
COMMONWEALTH OF INDEPENDENT STATES

TITLE
T-54 and T-55 Main Battle Tanks

DEVELOPMENT
The T-44 was used in combat towards the end of the Second World War and again during the Hungarian uprising of 1956. The T-44 was followed by the T-54, the first prototype of which was completed in 1946. Production of the T-55 is believed to have continued until as late as 1981.

DESCRIPTION
The all-welded hull of the T-54 is divided into three main compartments: driver's at the front, fighting in the centre and the engine and transmission at the rear. The turret is a one piece casting with the top, which consists of two D-shaped pieces of armour welded together down the centre, welded into position.

The T-54 and T-55 can be fitted with a snorkel for deep fording. The T-54 was not originally fitted with an NBC system; it was installed on later production tanks and subsequently refitted to earlier production models.

Main armament of the T-54 is a 100mm D-10T (originally called the M1944) rifled tank gun. The weapon has a maximum range in the indirect fire role of 14600m and can fire the following types of ammunition: AP (BR-412), APC-T (BR-412D), HE (F-412), HE-FRAG (OF-412), HEAT-FS (ZBK-5M) and HVAPDS-T (BM-8).

In 1991 the former Soviet Union stated that the T-54/T-55 series MBT fired the following main types of ammunition: APFSDS designated the ZBM-25 with a muzzle velocity of 1430 m/s; HEAT designated the ZBK-17M with a muzzle velocity of 1085 m/s; HE-FRAG with a muzzle velocity of 900 m/s.

Mounted to the right of the main armament is a 7.62mm SGMT machine gun and a similar weapon is fixed in the centre of the glacis plate. Mounted at the loader's position is a 12.7mm DShKM anti-aircraft machine gun.

VARIANTS

Since the T-54 was accepted for service, it has been upgraded many times with further development resulting in the T-55.

T-55 (1958) This is a T-54 with a new turret without the rooftop mushroom ventilator dome. It has a new stabiliser, an ammunition load increased to 43 rounds, new running gear and a more powerful V-55 diesel engine.

T-55A (1961) T-55 with radiation shielding added for protection against nuclear weapons. The 7.62mm SGMT machine guns of the earlier versions were replaced by a 7.62mm PKT machine gun.

Other improvements include the ability to lay a smoke-screen through the exhaust outlet, an NBC system, an air compressor for starting, redesigned front fuel tanks and ammunition compartment, night vision equipment for the commander, gunner and driver, and improved deep fording capability.

T-55 (1970) T-55 with a 12.7mm anti-aircraft machine gun mount over the loader's hatch (which was also fitted to the T-62) and other detailed improvements.

SPECIFICATIONS

	T-54	T-55
Crew	4	4
Length		
(gun forward)	9m	9m
(gun rear)	8.485m	8.485m
(hull)	6.04m	6.20m
Width	3.27m	3.27m
Height		
(cupola)	2.4m	2.35m
(with 12.7mm AA MG)	2.75m	2.70m
Max road speed	50km/h	50km/h
Max range		
(road)	510km	460km
(with long-range fuel tanks)	720km	650km
Armament		
(main)	1 x 100mm gun	1 x 100mm gun
(coaxial)	1 x 7.62mm MG	1 x 7.62mm MG
(bow)	1 x 7.62mm MG	none
(anti-aircraft)	1 x 12.7mm MG	none
Smoke-laying equipment	Diesel fuel injected into exhaust system	
Ammunition (main)	34	43
(7.62 mm)	3000	3500
(12.7 mm)	500	none
Traverse (at max power)	360° in 21 s	360° in 21 s
Gun elevation/depression	+17°/-5°	+18°/-5°

T-62M Main Battle Tank

SECTION
MBTs AND MEDIUM TANKS

COUNTRY
COMMONWEALTH OF INDEPENDENT STATES

TITLE
T-62 Main Battle Tank

DEVELOPMENT

The T-62 MBT was designed by the Kartsev Bureau, 'Vagonka' at Nizhnyi Tagil from the earlier T-55 MBT and incorporates a number of components from that vehicle. Production of the T-62 continued in the Soviet Union until 1975 by which time about 20000 tanks had been completed.

Main recognition features of the T-62 compared with the earlier T-54/T-55 are a longer and wider hull, different spacing of the road wheels as the T-62 has a distinct gap between the third and fourth and fourth and fifth road wheels, shape of the turret, and the longer and fatter gun barrel with a fume extractor towards its muzzle.

DESCRIPTION

The hull of the T-62 is divided into three compartments, driver's at the front, fighting in the centre with the engine and transmission compartment at the rear.

The cast turret is in the centre of the tank with the commander and gunner seated on the left and the loader on the right. Both are provided with a single piece hatch cover that opens to the rear and can be locked vertically. Rails outside the turret can be used by infantry or for stowing personal equipment.

A centralised ethylene-bromide fire extinguishing system is automatically activated by heat sensors of which there are eight in the engine, transmission and fighting compartments, or activated manually by the tank commander or driver.

The T-62 MBT has a PAZ nuclear collective protection system which consists of a radiation detector/actuator (RBZ-1m), five separate explosive squib mechanisms and a blower/dust separator. The box-like radiation detector/actuator (a radiation threshold detector) is mounted on the right side of the turret compartment behind the compressed air tanks.

The T-62 can, like other former Soviet tanks, lay its own smoke-screen by spraying diesel oil into the exhaust manifold when it is sufficiently hot.

The tank can ford to a maximum depth of 1.4m without preparation. It can also ford deep water when fitted with a snorkel.

Main armament of the T-62 MBT is a U-5TS (2A20) 115mm smooth-bore gun fitted with a bore evacuator, with a maximum rate of fire of four rds/min when at a standstill. A 7.62mm PKT machine gun mounted coaxially to the right of the main armament has a practical rate of fire of 200 to 250 rds/min and is fed by a belt containing 250 rounds.

VARIANTS

Since the T-62 was accepted for service in 1962 it has been updated.

T-62 (1967) Improved model of the first production version with a new engine deck and other detailed improvements.

T-62 (1970) T-62 with 12.7mm anti-aircraft machine gun mount over loader's position and some other detailed improvements.

SPECIFICATIONS

Crew	4
Length	
(gun forward)	9.335m
(gun rear)	9.068m
Length (hull)	6.63m
Width	3.3m
Height	2.395m
Max speed	
(1st gear)	14.5km/h
(2nd gear)	20km/h
(3rd gear)	29km/h
(4th gear)	45.5km/h
(5th gear)	50km/h
(reverse)	7km/h
Max range	
(paved road)	450km
(dirt road)	320km
(paved road with additional fuel tanks)	650km
(dirt road with additional fuel tanks)	450km
Armament	
(main)	1 x 115mm gun
(coaxial)	1 x 7.62mm MG
(anti-aircraft)	1 x 12.7mm MG (on T-62M only)
Smoke-laying equipment	diesel fuel injected into exhaust system
Ammunition	
(main)	40
(coaxial)	2500
(anti-aircraft)	300
Traverse	360°
Gun elevation/depression	+16°/-6°

PT-76 Light Amphibious Tank

SECTION
LIGHT TANKS (under 25000kg)

COUNTRY
COMMONWEALTH OF INDEPENDENT STATES

TITLE
PT-76 Light Amphibious Tank

DEVELOPMENT

The PT-76 light amphibious tank was developed shortly after the Second World War by the I 'V Gavalov OKB design bureau under the designation K-90 and was accepted for service in 1950 as the PT-76. Total production is believed to have amounted to 7000 vehicles with final deliveries being made in the late 1960s.

Many automotive and sub-components of the PT-76 light amphibious tank are also used in the BTR-50 armoured personnel carrier and other vehicles such as the SA-6 'Gainful' SAM system and the ZSU-23-4 self-propelled anti-aircraft gun system.

The main drawbacks of the PT-76 are its large size necessitated by the requirement to be amphibious, its lack of NBC or night fighting equipment and its very thin armour which can be penetrated even by heavy machine gun fire. It does have an excellent amphibious capability and is also used by the Naval Infantry.

DESCRIPTION

The hull of the PT-76 is of welded steel and is divided into three compartments with the driver at the front, the fighting compartment in the centre and the engine at the rear.

The PT-76 is fully amphibious, being propelled by two water-jets mounted at the rear of the hull. The PT-76 is not fitted with an NBC system although there is a ventilator mounted in the turret rear.

The main armament of the PT-76 is the 76.2mm D-56T gun which is a development of the gun used in the T-34/76 and KV-1 tanks during the Second World War. The gun can fire the following types of fixed ammunition: AP-T (BR-350 series), API-T (BZR-350B), HE-FRAG (0-350A), HEAT-FS (BK-354M) and HVAP-T (BR-354P). Other types of projectiles are also available, some with cartridges with reduced propellant charges, for HE-FRAG and AP-T projectiles.

A 7.62mm SGMT machine gun is mounted coaxially to the right of the main armament. Many PT-76s have been fitted with a 12.7mm DShKM anti-aircraft machine gun.

VARIANTS

The first production version of the PT-76 light tank was armed with the D-56T gun and fitted with a multi-slotted muzzle brake. The most common version of the PT-76 is fitted with the D-56TM gun with a double-baffle muzzle brake and a bore evacuator towards the muzzle.

Chinese Type 63 This has a similar hull to the PT-76 but has a different turret.

NIMDA Upgrade Package for the PT-76 The Israeli company NIMDA offers a complete retrofit package for the PT-76 light amphibious tank including a new power pack incorporating a Detroit Diesel 6V-92T diesel developing 300 hp at 2100 rpm coupled to the original transmission with a new clutch assembly.

The Soviet 7.62mm machine gun has been replaced by a Western 7.62mm machine gun and a similar weapon can be mounted on the turret roof for air defence.

SPECIFICATIONS (PT-76B)

Crew	3
Length	
(gun forwards)	7.66m
(hull)	7.22m
Width	3.17m
Height(overall)	2.255m
Max speed	
(road)	44km/h
(water)	8-9km/h
Max range	
(road)	394km
(road, with auxiliary tanks)	480km
(water)	65km
Armament	
(main)	1 x 76.2mm gun
(coaxial)	1 x 7.62mm MG
(anti-aircraft)	1 x 12.7mm MG (optional)
Smoke-laying equipment	diesel fuel injected into exhaust system
Ammunition	
(main)	40
(MG)	1000
Gun elevation/depression	+30°/-4°

BMP-1 Infantry Fighting Vehicle

SECTION
ARMOURED PERSONNEL CARRIERS

COUNTRY
COMMONWEALTH OF INDEPENDENT STATES

TITLE
BMP-1 Infantry Fighting Vehicle

DEVELOPMENT

The Object 765 design from Isakov design bureau was accepted to meet the requirements of the Russian Army and was subsequently called the BMP-1 (Boevaya Mashina Pekhota). The vehicle made its first public appearance during the November 1967 Moscow Parade. Until its correct designation became known, the vehicle was known in the West as the M1967 and then the BMP-76PB, with the 76 in the designation being the calibre of the main armament.

The BMP-1 was subsequently replaced in production by the much improved BMP-2.

DESCRIPTION

The hull of the BMP-1 is made of all-welded steel which provides the crew with protection from small arms fire and shell splinters. The driver sits at the front of the hull on the left side and has a single piece hatch cover that opens to the right. The commander is seated behind the driver and has a cupola that can be traversed through a full 360°.

Main armament of the BMP-1 is a 73mm Model 2A28 smooth-bore, low pressure, short-recoil gun. The projectile is the same as that used in the SPG-9 infantry weapon and has a maximum effective range of 1300m. Mounted coaxially to the right of the main armament is a 7.62mm PKT machine gun which is fed from a continuous belt of 2000 rounds honeycombed in an ammunition box mounted below the weapon. There is a turret ventilator system for extracting fumes.

Mounted over the main armament is a launcher for a 'Sagger' wire-guided ATGW. One missile is carried in the ready to launch position with a further two missiles in the turret, these are loaded via a loading rail through a hatch in the forward part of the turret roof. A further two missiles are carried in the hull.

The BMP-1 is fully amphibious, being propelled in the water by its tracks.

Should a nuclear explosion take place, the protection system ensures automatic shut down of the engine, closing of the engine louvres, stopping the ejector and valves of the turret and troop compartment fans, stopping the fans and supercharger, turning off the electric drive of the turret, and switching on the absorbent filter air delivery system. When the shock wave has passed the driver/mechanic turns on the supercharger, which provides decontaminated air at overpressure for the inhabited compartment of the BMP-1.

SPECIFICATIONS

Crew	3 + 8
Length	6.74m
Width	2.94m
Height	
(over searchlight)	2.15m
Max speed	
(road)	65km/h
(water)	7km/h
Max range	550-600km
Armament	
(main)	1 x 73mm gun
(coaxial)	1 x 7.62mm MG
(other)	1 launcher rail for 'Sagger' ATGW
Smoke-laying equipment	diesel fuel injected into exhaust
Ammunition	
(main)	40
(coaxial)	2000
(other)	4 + 1 'Sagger'
Traverse	360°

BMP-2 Infantry Fighting Vehicle

SECTION
ARMOURED PERSONNEL CARRIERS

COUNTRY
COMMONWEALTH OF INDEPENDENT STATES

TITLE
BMP-2 Infantry Fighting Vehicle

DEVELOPMENT

The original BMP-1 ICV suffered from a number of disadvantages including the position of the commander in front of the hull to the rear of the driver, the 73mm gun was not effective and the ATGW over the 73mm was difficult to control.

After evaluating a number of different prototype vehicles, the Object 675 was finally selected as the BMP-2 in the late 1970s. The Russian Army is estimated to have over 20000 BMP-2 vehicles with production still continuing for the export market. In 1993 the selling price of the BMP-2 was $400,000.

DESCRIPTION

The chassis of the BMP-2 is almost identical to that of the earlier BMP-1, but has increased armour protection. The driver sits at the front of the vehicle on the left side. On the BMP-1 the commander sits to the rear of the driver, but on the BMP-2 is moved to the turret so this position is occupied by an infantryman.

An infra-red searchlight is mounted coaxial to the right of the 30mm cannon and the commander also has a roof-mounted infra-red searchlight Model OU-3GA2.

Main armament comprises a 30mm cannon Model 2A42 with an elevation of +74°.

CIS sources claim that the 30mm cannon has an effective range against ground targets of 1000m although it is sighted to 4000m.Its high elevation of +75° allows it to be used against aircraft and helicopters.

Mounted on the turret roof between the gunner's and commander's hatches is a 'Spandrel' AT-5 ATGW as on the latest model of the BRDM-2 (4 x 4) amphibious reconnaissance/anti-tank vehicle. The 'Spandrel' is a second-generation type and has a maximum range of 4000m.

In addition to the rifles and machine guns of the infantry carried in the BMP-2, an anti-tank grenade launcher and one SA-7/SA-14/SA-16 surface-to-air gripstock and two missiles in their launcher tubes are carried, although the SAMs are not carried by every BMP-2.

Like the BMP-1, the BMP-2 is fully amphibious.

Standard equipment on the BMP-2 includes a full range of night vision equipment for commander, gunner and driver, a fire extinguishing system, a GPK-59 gyro compass system, a PAZ overpressure NBC system, an engine preheater and a turret extractor fan.

SPECIFICATIONS

Crew	3 + 7
Length	
(gun forward)	6.735m
(hull)	6.735m
(gun rear)	7.295m
Width	
(overall)	3.15m
(over tracks)	2.85m
Height	
(to commander's sight)	2.45m
(for air transport)	2.25m
Max road speed	
(5th gear)	65km/h
(4th gear)	43.3km/h
(3rd gear)	29.1km/h
(2nd gear)	19.6km/h
(1st gear)	10.6km/h
(reverse)	10.6km/h
Max water speed	7km/h
Max range	550-600km
Armament	
(main)	1 x 30mm 2A42 cannon
(coaxial)	1 x 7.62mm PKT MG
(other)	1 launcher for AT-5 'Spandrel' or AT-4 'Spigot'
ATGW	
Smoke-laying equipment	2 x 3 81mm smoke grenade dischargers, diesel fuel injected into exhaust
Ammunition	
(main)	500
(coaxial)	2000
(ATGW)	4
Traverse	360ø
Gun elevation/depression	+75°/-5°

ANTI-AIRCRAFT/ARTILLERY/SAMS

Boeing Avenger Pedestal-Mounted Stinger

SECTION
SELF-PROPELLED SURFACE-TO-AIR MISSILES

COUNTRY
UNITED STATES OF AMERICA

TITLE
Boeing Avenger
Pedestal-Mounted Stinger
Self-Propelled Air Defence System

DEVELOPMENT
In the early 1980s the Defence Systems Division of the Boeing Aerospace Company developed the Avenger air defence system as a private venture. The Avenger consists of a 4 x 4 High Mobility Multipurpose Wheeled Vehicle (HMMWV) with a turret mounted in the rear with eight missiles in the ready to launch position. The turret can also be deployed as a fixed stand-alone unit.

Target acquisition is either by direct vision using the optical sight or through the use of a Forward-Looking Infra-Red (FLIR) system. Mounted either side of the turret are four Stinger SAMs which are identical to those used in the manportable version. For the US Army PMS system, Stinger missiles are standard, but it can accommodate other sensors and other weapon systems including Hellfires, HYDRA 70 70mm unguided rockets, and other infra-red seeking or RBS 70 laser guided missiles.

DESCRIPTION
Production Avengers are fitted with AN/PRC-77 and AN/VRC-47 radios and can accommodate the AN/VRC-91 SINCGARS radio system when this is fielded. FAAD C^2I equipment will also be incorporated as it is fielded with the gunner and driver communicating with each other via the AN/VIC-1 intercom system.

SPECIFICATIONS (FIM-92C Stinger Missile)

Length	1.52m
Body Diameter	0.070m
Launch weight	10.1kg
Propulsion	solid fuel ejector and boost/sustainer rocket motors
Guidance	passive infra-red/ultraviolet homing seeker
Warhead	3kg HE fragmentation
Max speed	Mach 2.2
Max range	greater than 4500m
Min range	200m

MIM-146 ADATS

SECTION
SELF-PROPELLED SURFACE-TO-AIR MISSILES

COUNTRY
CANADA

TITLE
Oerlikon Aerospace ADATS Missile System

DEVELOPMENT

In 1979, Oerlikon-Buhrle of Switzerland, with prime subcontractor Martin Marietta of the USA, commenced development of a low level missile system to defeat both air and ground threats. Extensive analysis of current and projected threats determined that the Air Defence Anti-Tank System (ADATS) must be an all-weather missile system, designed to protect field troops and Vital Point (VP) targets against low-flying fixed-wing aircraft, attack helicopters, Remotely Piloted Vehicles (RPVs), cruise missiles and armoured vehicles.

In June 1986, after an exhaustive evaluation, ADATS was selected by the Canadian Armed Forces to fulfil its Canadian Forces Low Level Air Defence System (CF LLADS) requirements. In 1987 ADATS was one of the four weapon systems that competed in the US Army's Forward Area Air Defence - Line-of-Sight - Forward-Heavy (FAAD-LOS-FH) competition. In November 1987, ADATS was selected as the winner. After only eight ADATS were delivered to the US Army, the programme was halted in 1992 because of US DoD budgetary cuts.

DESCRIPTION

ADATS is a multi-purpose, all-weather low level missile system designed to defeat both air and ground targets. The air targets, including attack helicopters flying nap-of-the-earth at ranges of up to 10 km, can be engaged at very low altitudes.

SPECIFICATIONS (ADATS missile system)

Type	single-stage, multipurpose anti-armour and low altitude air defence
Length	2.08m
Body Diameter	0.152m
Launch weight	51kg
Warhead	12.5 kg dual-purpose HE fragmentation/shaped charge
Guidance	laser beam rider using digitally coded CW CO_2 laser
Propulsion	Smokeless solid propellant rocket motor
Range	
(air and ground targets)	10000m
(high-speed manoeuvring aerial targets)	8000m

FROG-7

SECTION
OFFENSIVE WEAPONS

COUNTRY
RUSSIA

TITLE
FROG-7 (9M-21/R-70 Luna-M)

TYPE
Short range, road mobile, solid propellant, single warhead, unguided rocket

DEVELOPMENT
Free Rocket Over Ground (FROG) was the NATO name given to this first generation Russian rocket, first developed in the 1950s. The Russian name for this missile is Luna-M, and their designation is R-70 or 9M21. The FROG-7 is the last of the FROG series; it first appeared in 1965 and was replaced by the SS-21 'Scarab' Short Range Ballistic Missile (SRBM). Over the various generations the FROG system has seen considerable improvement and the -7 version is now widely deployed.

DESCRIPTION
The FROG-7 is 9.1m long, with a 0.54m body diameter. It has a launch weight of 2300kg and a range of 70km. FROG-7 has a solid propellant motor and is spin stabilised but unguided. The 450kg warhead can either be conventional HE, submunitions, chemical or the A22 nuclear (in the 25 kT range). The FROG-7 is transported and launched from an eight-wheeled ZIL 135 LTM transporter-erector-launcher vehicle, with a reported reload capability of one rocket every 20 minutes from reload vehicles carrying three rockets each.

SPECIFICATIONS

Length	9.1m
Body diameter	0.54m
Launch weight	2300kg
Payload	single warhead; 450kg
Warheads	conventional HE, chemical or nuclear (25 kT)
Guidance	unguided
Propulsion	Solid propellant
Range	70km

Dog Ear Surveillance Radar

SECTION
BATTLEFIELD, MISSILE CONTROL AND GROUND SURVEILLANCE RADAR SYSTEMS

COUNTRY
COMMONWEALTH OF INDEPENDENT STATES

TITLE
DOG EAR SURVEILLANCE RADAR

TYPE
Surveillance and target acquisition radar

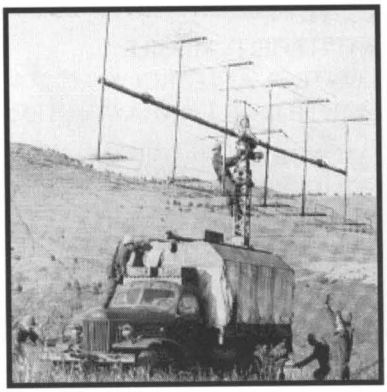
DESCRIPTION
Dog Ear is the NATO code-name for an early warning surveillance and target acquisition radar used primarily to provide target information for the SA-9 'Gaskin' and SA-13 'Gopher' low altitude surface-to-air missiles.

Dog Ear is normally mounted on a tracked vehicle, on a basis of one system for each air defence battery/battalion. Range of the system is about 50km. Frequency is probably in the F/G-band. Acquisition range is 80km and the tracking range 35km.

SPECIFICATIONS

None Available

Spoon Rest Radar



SECTION
LAND-BASED AIR DEFENCE RADARS

COUNTRY
COMMONWEALTH OF INDEPENDENT STATES

TITLE
SPOON REST RADAR

TYPE
Mobile early warning radar

DESCRIPTION

Known in the CIS as the P-12, the radar known to NATO as Spoon Rest is a UHF band early warning radar that is used sometimes in conjunction with the Fan Song radars and the SA-2 'Guideline' and SA-3 'Goa' missiles.

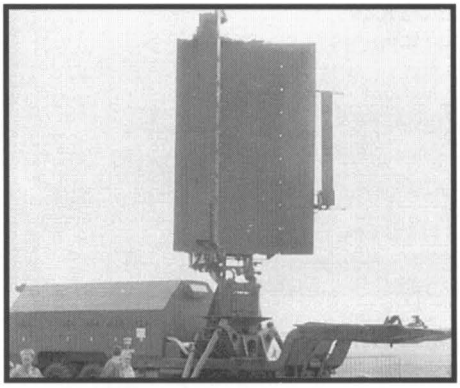
The initial version, Spoon Rest A, is mounted on a trailer van, while the improved Spoon Rest B is mounted on a ZiL-157 truck. As in the case of Knife Rest B/C, a full system consists of three elements: the radar/command vehicle, generator truck and NRZ-1 Fish Net IFF antenna. In the 1970s a modernised version, Spoon Rest C, was developed and is mounted on a van or a Ural 375 truck. A navalised version has been developed and installed on the 'Sverdlov' class cruisers.

A later version, Spoon Rest D is a target acquisition radar derived from Spoon Rest A. The main difference between the 'A' and 'D' models is that the 'D' has eight dipoles instead of six.

SPECIFICATIONS

Frequency	147-161 MHz
Peak power	180-350 kW
PRF	310-400 pps
Pulsewidth	4-5 æs
Effective range	200-275km
Effective altitude	18-20km
Beamwidth	
horizontal	7-9°
vertical	2.5°

Tin Shield Radar



SECTION
LAND-BASED AIR DEFENCE RADARS

COUNTRY
COMMONWEALTH OF INDEPENDENT STATES

TITLE
TIN SHIELD

TYPE
Early warning and GCI radar

DESCRIPTION
Tin Shield is the NATO designation for a recently developed 3D mobile early warning and GCI radar, optimised for low altitude aircraft detection. No details of its performance are available. It is normally associated with the SA-5 and SA-10 missiles. Range is reported to be about 350km, using a phased-array antenna. From the photograph it appears to be mechanically rotated in azimuth, and probably uses electronic scanning for heightfinding.

SPECIFICATIONS

None Available

122mm Howitzer M-1974

SECTION
SELF-PROPELLED GUNS
AND HOWITZERS

COUNTRY
COMMONWEALTH OF
INDEPENDENT STATES

TITLE
122mm Self-propelled Howitzer M-1974
(2S1)

DEVELOPMENT

The correct military designation for this weapon is SO-122 but it is commonly known as the Gvozdika (Carnation). Its industrial number is 2S1 and NATO usually refers to it as the M-1974, the year it was first seen in public.

The 2S1 was developed at the Khar'kov Tractor Works with first production vehicles being completed in 1972, with production being completed around 1991.

DESCRIPTION

The all-welded steel hull of the M-1974 is divided into three compartments: driver's at the front on the left, engine behind the driver and the turret at the rear.

The M-1974's main armament, designated the 2A31, is a modified version of the 122mm D-30 towed howitzer. Of the 40 122mm projectiles normally carried, 32 are HE, six smoke and two HEAT-FS. The 122mm 2S1 can also fire the Kitolov-2 laser-guided artillery projectile.

Standard equipment includes infra-red night vision lights and an NBC system. It is fully amphibious, being propelled in the water by its tracks.

SPECIFICATIONS (2S1)

Calibre	130 mm
Crew	4 + 2 in ammunition carrier vehicle
Length	7.26m
Width	2.85m
Height	2.725m
Max speed	
(road)	60km/h
(water)	4.5km/h
Max range	500km
Armament	
(main)	1 x 122mm howitzer Ammunition
(main)	40
Gun elevation/depression	+70°/-3°
Traverse	360°

M-46 130mm Field Gun

SECTION
TOWED ANTI-TANK GUNS, GUNS AND HOWITZERS

COUNTRY
COMMONWEALTH OF INDEPENDENT STATES

TITLE
130mm Field Gun M-46

DEVELOPMENT
The 130mm Field Gun M-46 was developed in the early 1950s and was first seen in public during the 1954 May Day parade. It replaced the 122mm M1931/37 (A-19) Field Gun and is ballistically similar to 130mm guns used by the former Soviet Navy. The M-46 has seen combat in many parts of the world, but has now been replaced in most front-line units.

DESCRIPTION
When travelling the barrel is withdrawn by a mechanism on the right trail from battery to the rear to reduce the overall length of the weapon. The carriage is of the split trail type and is provided with a two-wheeled limber. When travelling the spades are removed and carried on each of the two trails. The recoil system is mounted under the barrel, and in front of the shield, which has been removed on some models, is an inverted U-shaped collar. The M-46 field gun has the OP4M-35 direct fire sight with a field-of-view of 11° and a magnification of x5.5, and an APN-3 active/passive night sight. The M-46 has direct-fire sights including an APN-3 active/passive night sight.

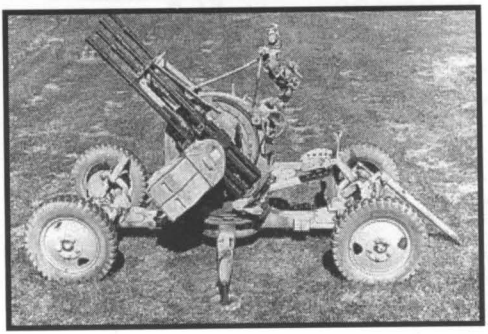
It fires case-type, variable-charge, separate-loading ammunition.

VARIANTS
Modified 130mm M-46s with a longer barrel, recuperator and cradle appeared in Soviet Army service in the mid-1970s.

SPECIFICATIONS

Calibre	130 mm
Length (travelling)	11.73m
Width (travelling)	2.45m
Height (travelling)	2.55m
Rate of fire	5-6 rds/min
Range	27150m
Crew	8

ZPU-1/2/4 Anti-Aircraft Guns



SECTION
TOWED ANTI-AIRCRAFT GUNS

COUNTRY
COMMONWEALTH OF INDEPENDENT STATES

TITLE
14.5mm ZPU Series of Anti-aircraft Machine Guns (ZPU-1, ZPU-2 an d ZPU-4)

DESCRIPTION

ZPU-1 The ZPU-1 was introduced into the former Soviet Army immediately after the Second World War and, like the ZPU-2 and ZPU-4, uses the 14.5mm Vladimirov KPV heavy machine gun which has a quick-change barrel. It is also fitted to a number of AFVs including the T-10M tank, BRDM-2 reconnaissance vehicle, BTR-60PB (8 x 8) APC, BTR-70 (8 x 8) APC, BTR-80 (8 x 8) APC, Czechoslovak OT-64 (8 x 8) APCs models OT-64C(1) and OT-64C(2) and the OT-62C tracked APC.

All weapons in this series fire the following fixed ammunition: API (BS 41) projectile, API-T (BZT) projectile and I-T (ZP) projectile.

ZPU-4 The ZPU-4 entered service with the former Soviet Army in 1949 and although no longer in front-line service with the former Soviet Army, like the ZPU-2 may be found in second-line units defending airfields and other high priority targets.

SPECIFICATIONS

	ZPU-1	ZPU-2 (early)	ZPU-2 (late)	ZPU-4
Calibre	14.5 mm	14.5 mm	14.5 mm	14.5 mm
Length (travelling)	3.44m	3.536m	3.871m	4.53m
Width (travelling)	1.62m	1.92m	1.372m	1.72m
Height (travelling)	1.34m	1.83m	1.097m	Axis of bore
(firing)	0.635m	0.8m	n/a	1.02m
Rate of fire (per barrel)				
(cyclic)	600	600	600	600
(practical)	150	150	150	150
Max range				
(horizontal)	8000m	8000m	8000m	8000m
(vertical)	5000m	5000m	5000m	5000m
Effective range(vertical)	1400m	1400m	1400m	1400m
Crew	4	5	5	5

FLASH POINT KOREA
NEW COMMANDS

MISSION PLANNING MAP

Alt G	Toggle **grid lines** on/off
Alt C	Toggle **contour map display** on/off

FLIGHT

A	Cycle **autopilot mode** (fly straight, follow waypoints, none)
Ctrl R	**Engage/disengage rotor** (toggle) (use for autorotational landing practice)
R	**Apply rotor brake** (use for FARP visits, landings)
Ctrl S	**Replay last mission-specific radio message**

DAMAGE CONTROL COMMANDS

Ctrl F	Activate **fire extinguisher** (once per mission; works on either engine)
Ctrl [	**Shut down engine 1** (left)
Ctrl]	**Shut down engine 2** (right)

WEAPON/TARGETING COMMANDS

Alt A	Toggle **PRIORITISE AIR TARGETS** option on/off (co-pilot/gunner locks onto air targets first)
L	**Add target** to TADS target list (if SPOTTING is off in CP/G options)
G	Cycle through **gun burst rates** (10, 20, 50 or 100 rounds per trigger pull)

WINGMAN COMMANDS

Ctrl 4	**Pop Up and Scan Area** (replaces *Give Me Your Targets*)
Ctrl 8	**Check Status** (weapons loadout)
Ctrl 9	**Stay Here** (maintain current position)
Ctrl 0	**Change Formation** (50 or 150m)
Ctrl -	**Attack ATA/ATG targets** (if wingman in *Weapons Free* mode)
Ctrl +=	**Cover Me** (wingman attacks anything that threatens you)
Ctrl H	**Go Home** (return to base — formerly Ctrl 8)
Ctrl Bksp	**Hand Off Targets** (will not fire until you give *Weapons Free* command)

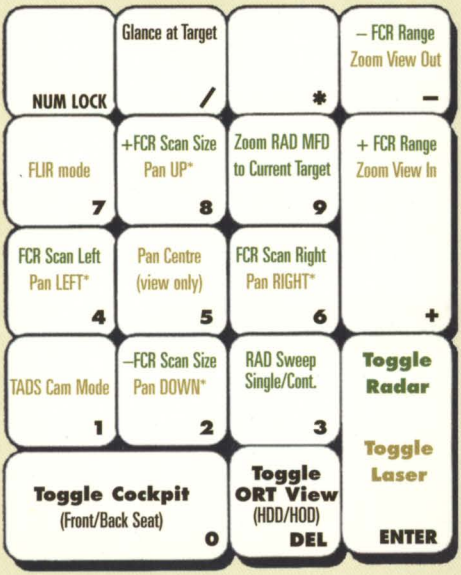
HEAD-DOWN/HEAD-OUT DISPLAY

OPTICAL RELAY TUBE (ORT) VIEW COMMANDS

FCR Commands

TADS Commands

* TADS camera and exterior camera views



COCKPIT COMMANDS

Numpad [0]	Toggle cockpit between **front-seat (CP/G) or back-seat (pilot)**
Numpad [Del]	Toggle ORT view between **Head-Down/Head-Out Display**
Numpad [/]	**Glance at target** (toggle TADS HDD view, display current target image)

FCR ACTIVE (with REALISTIC FCR OPERATION/REALISTIC FCR RANGE active)

Numpad [Enter]	Toggle **radar (FCR mode) or laser (TADS mode)** on/off
[Z], [X] or Numpad [+], [–]	Increase, decrease **radar range** (to .5, 1, 2, 4 or 8km)
Numpad [3]	Toggle **radar sweep mode** to single (one-time scan) or continuous constant scan
Numpad [9]	**Zoom around current target** in Radar MFD
Numpad [4], [6]	**Control direction** of Fire-Control Radar scan (left or right)
Numpad [8], [2]	**Increase, decrease arc size** of FCR scan (up to 90 degrees)
[Ctrl] [~]	**Download ABCCC targets** to the Longbow target list

TADS ACTIVE (with REALISTIC TADS OPERATION active)

Numpad [1]	Cycle between **TADS camera modes** (FLIR, DVO and DTV)
Numpad [7]	Toggle **TADS** between **white-hot/black-hot FLIR imagery**
[Z], [X] or Numpad [+], [–]	Switch **TADS camera zoom level** to Wide, Narrow (and Medium, for FLIR)

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